(Preliminary Abstract)

THE DISTRIBUTION OF NATURALLY OCCURRING THORIUM IN BASELINE FECAL SAMPLES AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (FEMP)

J.W. Neton Ph.D. and M. Soldano
Fernald Environmental Management Corporation (FERMCO)
P.O. Box 538704
Cincinnati, Ohio 45253-8704

Thorium, along with other naturally occurring radionuclides, is present in measurable amounts in biological materials and in the environment. Dietary ingestion of these materials and exposure to environmental sources results in measurable quantities of thorium in fecal samples collected from individuals. This is supported by the presence of thorium in individuals who were never exposed to occupational thorium sources. Concentrations of natural thorium in bioassay samples may vary between individuals in a given population due to differences in dietary intake and to the length of exposure to the environmental sources. Because of this variability, it is important that the distribution of naturally occurring thorium be considered in the design of a routine bioassay monitoring program and the assignment of occupational dose.

In support of an occupational monitoring program for exposure to thorium, approximately 500 baseline fecal samples were collected and analyzed for Th-232, Th-230, and Th-228. This paper presents the results of these analyses, along with the statistical methods used in the evaluation of the data. From these results, decision levels were established using a statistically based confidence interval to evaluate occupational exposure to thorium. The data illustrates the difficulties in performing internal monitoring of workers as a result of natural thorium interference and emphasizes the need to have adequate workplace monitoring programs.